Lewis Rosenfelder's

BFBLIB

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DISK SOFTWARE FOR THE TRS-80®

BASIC

121 Functions • subroutines • & user routines for the model I & III

REQUIRES TWO DISK DRIVES

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BFBLIB T.M.

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DISK SOFTWARE FOR THE TRS-80 ®

Version 1.0 01/01/82

The BFBLIB diskette is recorded in TRS-80 Model I format
(35 tracks, single density)

Manufactured for Radio Shack by IJG Inc.

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Lewis Rosenfelder's

BFBLIB T.M.

BASIC FASTER AND BETTER ™ *LIBRARY*

DISK SOFTWARE FOR THE TRS-80.

Version 1.0 01/01/82

**The BFBLIB diskette is recorded in TRS-80 Model 1 format
(35 tracks, single density)**

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Introduction

The 'BFBLIB' diskette contains all of the major subroutines, functions and utility programs that are in the book, 'BASIC Faster and Better & Other Mysteries' by Lewis Rosenfelder — Radio Shack Stock # 62-1002.

Now, at your finger-tips, you have a convenient library of techniques, subroutines, functions, utilities and tricks. You will soon find that many programming challenges can be solved quickly by merging the routines you need, when and where you need them. All but the shorter routines are included — no typing, proof-reading or debugging is necessary.

The book, 'BASIC Faster and Better & Other Mysteries' (*not included*), is your main documentation and instruction manual for the BFBLIB diskette. Before attempting to use any programs or routines, be sure to carefully read the sections of the book that pertain to the program or routine you are using.

There is a brief description of each demonstration program's function below and a reference to the page in 'BASIC Faster and Better & Other Mysteries' where you will find complete information concerning each function, subroutine, USR routine and utility program.

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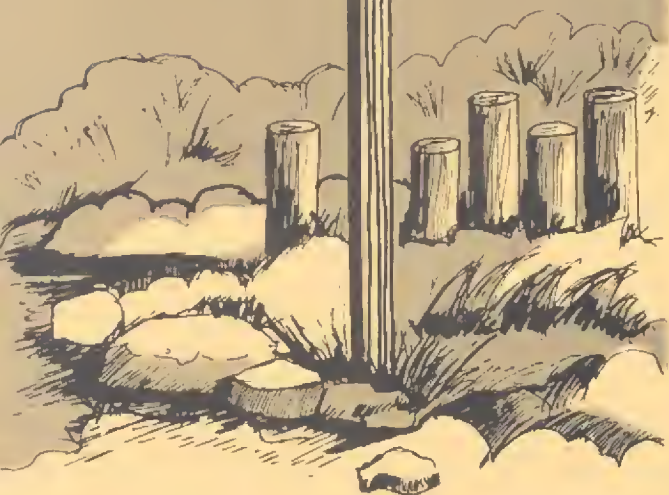
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Two change of address cards have been included so that you may continue to receive information in the event that you move. Copy all address information from the Registration Card onto them prior to sending the Registration Card. They must show your "old address" exactly as you originally registered it with us.

Change of address

NEW ADDRESS

Name _____

Company _____

Address _____

City _____ Phone (____) ____ - _____

State _____ Zip _____

OLD ADDRESS

Name _____

Company _____

Address _____

City _____ Phone (____) ____ - _____

State _____ Zip _____

Change of address

NEW ADDRESS

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Company _____

Address _____

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What to do First

If you have a TRS-80 Model I, with the TRSDOS 2.3 operating system, your first step is to make a backup copy of the BFBLIB diskette, using the procedures explained in the 'TRSDOS & Disk BASIC Reference Manual' for formatting and copying a diskette.

If you have a TRS-80 Model III, you will need to use the CONVERT utility (see your Disk System Owner's manual), to transfer the diskette's contents to double-density Model III diskettes. Then you can make your backup copy. All the BFBLIB programs can be stored on a single Model III system diskette.

After you've made a backup copy, use it as your working copy — DO NOT use your original for day-to-day programming. If you want to make modifications and additions, be sure to keep your original copy unaltered for protection. As an added precaution, be sure that your original copy is 'write protected.' Check your manual for details on how to do it on your system. Do not 'write protect' your WORKING DISK. The write protect notch should be uncovered.

The BFBLIB Diskette

The BFBLIB diskette contains 121 functions, subroutines, USR routines and utilities in the 21 files listed below. The 16 files that have the '/BAS' extension are 'utility' and 'driver' programs that can be run according to the instructions in 'BASIC Faster and Better & Other Mysteries.' The 4 files with the '/LIB' extension are libraries of routines saved as BASIC 'programs.' If you LIST or LLIST them you will see 55 functions, 30 BASIC subroutines, plus 19 USR routines in two different data statement formats. They are ready for you to extract and use in any program.

All of the '/BAS' and '/LIB' files have been saved in normal compressed binary format except 'LINEMOD/BAS' and 'ANALYZE/BAS,' which were saved with the 'A' option, ready to be merged into programs that you may wish to analyze or modify.

VDRIVE2/BAS	SROUTINE/LIB	USRDATA1/LIB	MOVEDATA/BAS
SEARCH2/BAS	MERGEPRO/BAS	BASECONV/BAS	VDRIVE/BAS
USRDATA2/LIB	SETUPLIB/BAS	FUNCTION/LIB	DATECOMP/BAS
KILLFILE/BAS	LINEMOD/BAS	USRFILE/RND	DOSCHECK/BAS
DOCLIST/BAS	ANALYZE/BAS	CHANGE/BAS	VIDEOGEN/BAS
VSHEETS/BAS			

SETUPLIB/BAS is a special program that may be used to customize certain files on your BFBLIB diskette to be compatible with the version of TRSDOS that you are using on your computer. It automatically does the modifications that are discussed in the book (the BFBLIB diskette programs are already set up to operate on TRSDOS 2.3 for the Model I).

Specifically, the 'MOVEX' and 'COMUNCOM' routines, as stored in the files 'USRDATA1/LIB,' 'USRDATA2/LIB' and 'USRFILE/RND' are modified so that the USR routine address pointers will be correct. This program can be run at any time to change the BFBLIB files.

SETUPLIB/BAS expects to find the required files 'on-line' and the data to be modified at specific byte positions within those files. It verifies that you have not added, deleted or edited lines preceding the points to be modified by checking a few bytes immediately preceding and following the data to be changed. Because of this, 'USRDATA1/LIB,' 'USRDATA2/LIB' and 'USRFILE/RND' must be exact copies of those found on your original 'BFBLIB' diskette, or the program will abort. Refer to the sections in the book that explain 'MOVEX,' 'COMUNCOM' and the 'Multiple Argument Handler' for an explanation of the modifications. 'MOVEX' is modified so that it will operate as USR0. 'COMUNCOM' is modified so that it will operate as USR7.

To run 'SETUPLIB/BAS,' load BASIC, specifying at least one file, then type . . .
    RUN "SETUPLIB/BAS"

The program will display the program's 'billboard' message until you press any key (except BREAK, of course). After you have pressed a key, the program will automatically find the correct addresses within the system you are using and then make the appropriate modifications to the BFBLIB files.

The Library Programs

These functions, subroutines, USR routines and utilities will unlock the power of your TRS-80, as described in 'BASIC Faster and Better & Other Mysteries.' You can modify each function, subroutine, USR routine and utility to suit your own ideas and needs, or simply use them as is. By loading an entire BFBLIB library file and adding a few program lines, you can quickly check out any function or subroutine without having to delete and merge another file. This is a powerful development tool to have at your finger-tips. The following are brief descriptions of each file and program on the library disk, with a page number reference to where you will find the complete documentation for them.

ANALYZE/BAS — This is the active variable analyzer. It lists all variables and arrays that are active in any BASIC program you are running. Whenever you are debugging a program and you want to display all active variables, you can temporarily merge it in. Then, when running the program you want to check, you can press BREAK and type 'GOSUB 65000' for a list of the active variables and their values.
  ● For more details see page 44

BASECONV/BAS — This, to save disk space, is a combination of two useful demonstration programs. The DECTOHEX/BAS program has been renumbered starting at line 1000. It lets you convert any decimal number from -32768 to 65535 to hexadecimal. The BASECONV/DEM program has been renumbered starting at line 2000. It lets you convert from decimal to *any* other base. When you run BASECONV/BAS a menu is displayed for you so that you can select either program.
  ● For more details see page 84

CHANGE/BAS — This program demonstrates the substring replacement subroutine. You can use it to make changes to BASIC program files that have been saved in ASCII format (with the 'A' option). You can also use it to replace selected strings within other types of sequential files, such as those created by word processing programs.
  ● For more details see page 95

DATECOMP/BAS — The purpose of this program is to demonstrate and test the date computation function calls, but it's handy to have around as a 'perpetual calendar.'
  ● For more details see page 112

DOCLIST/BAS — This program lets you print formatted listings of any BASIC program. Be sure that the program you wish to list has been saved on disk in compressed format (without the 'A' option). Depending on the type of line printer you have, you may need to delete the ' ; ' following the 'LPRINT CHR$(12)' in line 70 and 3240. Programs containing special graphics characters will require a printer capable of printing them in order to list the program using 'DOCLIST.'
  ● For more details see page 231

DOSCHECK/BAS — You'll want to run this program if you've got a disk operating system that is different from those listed in the appendix. It gives you the USR routine pointer, disk buffer and disk DCB addresses. Be aware that a temporary file is created, then killed on drive 0, so the diskette must not be write protected!
  ● For more details see page 240

FUNCTION/LIB — This file contains all the function definitions explained in the book. The functions occupy lines 1 through 55. They are indexed alphabetically and by line number in Appendix 8.

It is most convenient to merge and renumber the functions you want with the MERGEPRO/BAS program. Or if you wish, you can load FUNCTION/LIB, delete the lines you don't want, renumber the remaining lines (if you have a RENUM program), save them in ASCII (with the 'A' option) and then merge them into the program you are writing.

When you wish to test a particular function, you can temporarily add a few program lines above line 55, or you can simply load FUNCTION/LIB and type RUN. Then, while in BASIC's command mode, you can test examples as they are shown in the book or you can try your own tests.

Remember that you must have loaded COMUNCOM to protect memory and executed a DEFUSR statement if you wish to test the FNKM$ function. Also note that because of its length, the FNBN$ function at line 20 cannot be merged into another program with BASIC's MERGE command. (You'll get a 'DIRECT STATEMENT IN FILE' error.) To solve this problem, you can temporarily delete several characters from the end of the line. After you've merged it, you can replace the missing characters with BASIC's edit capability.

KILLFILE/BAS — This program demonstrates the command string peel-off subroutine. You can use it when you have several files that you want to KILL.
  ● For more details see page 94

LINEMOD/BAS — This program is designed to be temporarily merged into another program so that you can POKE graphics and other special characters into the text.
  ● For more details see page 192

MERGEPRO/BAS — This is a utility that lets you merge and renumber selected lines from one or more BASIC program files. You can use it to pull selected lines from any programs that you have written. It is especially useful when you want to build programs by extracting lines from FUNCTION/LIB, SROUTINE/LIB, USRDATA1/LIB and USRDATA2/LIB.

Remember that you will need to specify at least one file when loading BASIC. If you have only 1 or 2 disk drives, you may remove the disk containing MERGEPRO/BAS when you see the prompt, 'SAVE USING PROGRAM NAME.' Then you can insert the disk on which you want to save the new program lines.

- For more details see page 236

MOVEDATA/BAS — This program demonstrates the 'move-data magic array.' You can use it to duplicate patterns in memory or to copy data from one address to another.

Be sure to be *careful* with this one! Until you are sure of what you are doing you should write protect or remove any disks that are in the drives.

- For more details see page 49

VSHEETS/BAS — This program prints video display planning sheets on your line printer. Depending on the type of printer you have, you may need to delete the ';' following the 'LPRINT CHR$(12).' The printer must be capable of 132 characters per line.

- For more details see page 180

SEARCH2/BAS — This program demonstrates the SEARCH2 USR routine. It can be handy whenever you wish to find selected strings in memory.

- For more details see page 164

SROUTINE/LIB — This is a large BASIC program file that contains all the major subroutines discussed in the book. They are indexed by line number in Appendix 9.

You can load SROUTINE/LIB and delete all lines except those you need, save them in ASCII (with the 'A' option), then merge the required lines into the program you are writing. Or you can use the MERGEPRO/BAS program to pull out and renumber the lines you want.

If you wish, you can test many of the subroutines directly from BASIC's command mode. Lines 1 through 99 of SROUTINE/LIB contain logic to CLEAR 1000, DEFINT A-Z and to load the move-data magic array (which is required by some of the subroutines). At line 99 is an END statement. You can type RUN and these 'housekeeping' functions will be done for you. Then, from 'READY' you can load the required variables and GOSUB to the proper line number to test a subroutine. Or if you wish, you can temporarily insert logic between lines 50 and 99 to test any of the subroutines.

VIDEOGEN/BAS — This program combines some of the routines and techniques discussed in the book, 'BASIC Faster and Better.' It uses the logic from the FREEFORM/DEM program to let you draw video displays with the graphics characters. The program displays the graphics characters and allows you to assign them to the CLEAR key. You can also select 'horizontal' or 'vertical' mode for graphics characters. (Vertical mode makes it easy to draw vertical bars, while horizontal mode positions the cursor to the right of the last graphics character printed, making it easy to draw horizontal patterns.)

VIDEOGEN/BAS also contains a subroutine at line 57400 that lets you save, by number, the video displays you create in any random disk file, then load them back as needed. This subroutine, unlike those listed in the book, uses the move-data magic array to transfer data from the screen to the disk buffer. It computes the disk buffer address automatically.

VIDEOGEN/BAS is a good demonstration of the screen save and flash back techniques explained in the book. When you go into 'command mode' to change the graphics character or to load or save a screen, the screen you were working with is temporarily saved in an integer array. Upon returning to the 'display mode,' the screen is instantly flashed back.

You also have the ability to turn a position indicator on or off in the bottom right corner of the screen. It displays the current 'PRINT@' position of the cursor, making it easy for you to plan video layouts.

All the commands available to you are explained by prompts on the screen. To use the program, specify at least one file upon entering BASIC and simply RUN "VIDEOGEN/BAS."

VDRIVE/BAS — If you have a Model I and you've installed an upper/lower case modification, you may need a driver for some of the demonstration programs (mainly for those in which the video display string pointer subroutine, line 40070, is used). You can use the driver program provided by Radio Shack 'ULCDVR' or you can run VDRIVE/BAS. You may need to modify the addresses used by VDRIVE/BAS according to the instructions in the book. Also, be sure to specify a memory size so that the driver will be protected. This program should not be used with LDOS, because LDOS has its own video driver routine.
- For more details see page 166

VDRIVE2/BAS — This program implements the logic in VDRIVE/BAS another way. It loads the video display driver below the program text; then it updates the beginning of text pointer so that the next program you load or run starts just above the driver. During execution of VDRIVE2/BAS, its line 0 is replaced by the machine-language upper/lower case logic. The final command in the program is NEW so that you're ready to go. To use it, simply RUN "VDRIVE2/BAS." Then you load or run the program you want. You don't need to set a special memory size and it can be used without modification for TRS-80's with any amount of memory!

VDRIVE2/BAS is documented in more detail with remark statements in the program text. You'll only need it if you've installed an upper/lower case kit in a Model I TRS-80, but the same idea can be very valuable to you for other machine-language programs or drivers you may be using.

CAUTION: Be sure to press the RESET button (rather than using CMD "S") before using any DOS function such as BACKUP or DIRectory because the VDRIVE2/BAS memory addresses may conflict with some of the DOS programs. This program should not be used with LDOS, because LDOS has its own driver.

USRDATA1/LIB — This is a BASIC program file that contains DATA statements for all the USR routines discussed in the book. Each group of DATA lines contains a list of numbers that can be POKEd into memory. To use them, you can merge the lines you need into your program. Then your program can read the numbers and POKE them into contiguous addresses in any area of protected memory. Once they are in memory, you can go to DOS READY and 'DUMP' the desired USR routines from memory to disk.

You can use the MERGEPRO/BAS program to extract and renumber the lines you need or you can load USRDATA1/LIB and delete the lines you don't need.

NOTE: In most cases, there will be no need to renumber data statements, unless you wish to change the sequence in which they will be read. Your program logic doesn't need to pass through the data statements. Appendix 10 indexes the data statements by line number for you.
- For more details see page 260

USRDATA2/LIB — This is another BASIC program file that contains DATA statements for all the USR routines discussed in the book. It contains numbers that can be read into integer arrays when you wish to use the 'magic array' technique for loading and executing USR routines.

You can use the MERGEPRO/BAS program to extract and renumber the lines you need, or you can delete the unneeded lines and merge those that remain into your program. Appendix 10 indexes the data statements for you.
- For more details see page 260

USRFILE/RND — This is the only file that is not in BASIC. It is a random disk file that contains the 'ready-to-execute' machine-language code for each of the USR routines. Each physical record contains a USR routine. To use it, open 'USRFILE/RND' as a random file from any BASIC program. Then do a DEFUSR, specifying the memory address of the disk buffer you are using (the addresses are listed in Appendix 3).

To use the routine you want, simply GET the proper record (as listed in Appendix 10) and do your USR call. It will be executed in the protected memory of the disk buffer. You don't need to reserve a special memory size!

NOTE: Since COMUNCOM occupies two 'records,' you will not be able to execute it within a disk buffer, but with two GET statements and 'move-data' techniques you can, in a few steps, move it to another location in protected memory for execution.
- For more details see Appendix 10

The **BFBLIB** diskette contains 121 functions, subroutines, USR routines and utilities in the 21 files listed below — all of the major subroutines, functions, and utility programs that are in the book, *'BASIC Faster and Better & Other Mysteries'*, by Lewis Rosenfelder.

DISK SOFTWARE FOR THE TRS-80®
Model I & III

ANALYZE/BAS	*SEARCH2/BAS*
BASECONV/BAS	*SETUPLIB/BAS*
CHANGE/BAS	*SROUTINE/LIB*
DATECOMP/BAS	*VIDEOGEN/BAS*
DOCLIST/BAS	*VDRIVE/BAS*
DOSCHECK/BAS	*VDRIVE2/BAS*
FUNCTION/BAS	*VSHEETS/BAS*
KILLFILE/BAS	*USRDATA1/LIB*
LINEMOD/BAS	*USRDATA2/LIB*
MERGEPRO/BAS	*USRFILE/RND*
MOVEDATA/BAS	

The 16 files with the /BAS extension are 'utility' and 'driver' programs that can be run according to the instructions in 'BASIC Faster and Better & Other Mysteries'. The 4 files with the **/LIB** extension are libraries of routines saved as **BASIC** programs. If you LIST or LLIST them you will see 55 functions, 30 BASIC subroutines, plus 19 USR subroutines in 2 different data statement formats. They are ready for you to extract and use in any program.

You will have a convenient library of techniques, subroutines, functions, utilities and tricks at your finger tips. You will soon find that many programming challenges can be quickly solved by merging the routines you need, when and where you need them.

The following Disk Operating Systems can be used†.
LDOS, TRSDOS 1.3, TRSDOS 2.3.

This software requires:
A TRS-80 Model I, expansion interface and 35 or 40 track, single-density disk drive or a TRS-80 Model III and 35 or 40 track, double-density disk drive.

This diskette is recorded in TRS-80 Model I format (35 track, single-density), to use with a TRS-80 Model III the Radio Shack **CONVERT** utility must be used.

NOTICE: Complete documentation for this software is contained in the book,

"BASIC Faster and Better & Other mysteries"